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<170> PatentIn Ver. 2.1

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Cys Ala Val Asn Thr Ile Lys Ser Asp Leu Glu Ile Phe Gly Arg Leu  
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Thr Pro Val Gly Asp Gly Ile Lys Met His Glu Thr Val Ile Asn Gln  
 100 105 110

Met Pro Pro Gln Ala Ala Val Ile Leu Leu Thr Asp Gly His Asn Asn  
 115 120 125

Leu Gly Met Asn Pro Val Glu Glu Val Lys Ser Ile Tyr Gln Thr Asn  
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aaa caa cgt tta cgt act caa ata gac att gtt gca tca gag agt ctt 144  
 Lys Gln Arg Leu Arg Thr Gln Ile Asp Ile Val Ala Ser Glu Ser Leu  
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aag ggt gtt gta ttc ttt gaa tta ggt aag act atc tgg gga cgt ggt 192  
 Lys Gly Val Val Phe Phe Glu Leu Gly Lys Thr Ile Trp Gly Arg Gly  
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gtt gat ggt gct tct att gga aca gat ggt aaa aat gtt ata aag ctc 240  
 Val Asp Gly Ala Ser Ile Gly Thr Asp Gly Lys Asn Val Ile Lys Leu  
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cgt tat tcc tat gtt gat tgg gtt att cct tac aca gat gtg. caa gtc 288  
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cgt atg ggt tta caa cct tat gtc ctt cca gga ttt gtt gca ggt tct 336  
 Arg Met Gly Leu Gln Pro Tyr Val Leu Pro Gly Phe Val Ala Gly Ser  
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 Thr Ile Leu Asp Ala Asp Gly Ala Gly Val Thr Val Ser Ala Val Phe  
 115 120 125

aat gat tat tta ggt gct aca gct ttc tgg atg cgt gca ttg cat aaa 432  
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 130 135 140

aac tat gat agt aat tat gga ata tca aag cta cct aac ttt aaa ggt 480  
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Val Gly Leu Ser Ala Glu Leu Ala Gly Ser Ser Pro Leu His Ile Ala			
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Val Asp Gly Ala Tyr Gly Arg Ala Asp Leu Gly Ser Leu Arg Asn Val			
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Val Ile Gly Asp Phe Leu Leu Asp Lys Ile Asp Leu Lys Arg Gln Gly			
275	280	285	
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Phe Gly Tyr Ser Gly Ala Tyr Gly Ile Gly Lys Asp Ser Val Phe Gly			
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Gly Thr Asn Asn Lys Asp Val Pro Glu His Leu Gly Leu Ser Tyr Val			

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Thr Thr Ile Tyr Asp Thr Arg Gly Gly Asp Asn Met Leu Tyr Leu Thr				
405		410		415
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Lys Lys Asp Tyr Ala Trp Glu Val Asp Phe Asp Thr Glu Tyr Lys Ile				
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Tyr Lys Asp Leu Ser Val Ala Leu Glu Leu Ser Tyr Ile Arg Leu Glu				
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ctt gat aaa aaa cta tgg aac ctt caa aga gaa gtt gat aag aat gcc				1392
Leu Asp Lys Lys Leu Trp Asn Leu Gln Arg Glu Val Asp Lys Asn Ala				
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Val Ile Gly Asp Phe Leu Leu Asp Lys Ile Asp Leu Lys Arg Gln Gly  
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360

365

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JC973 10/034500  
12/20/01

<110> JACOBS, Antonius A.C.  
VERMEIJ, Paul

<120> LAWSONIA INTRACELLULARIS VACCINE

<130> JACOBS ET AL.

<140> To be assigned  
<141> 2001-12-20

<150> EP00204660.5  
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Leu Val Asp Tyr Ser Gly Ser Met Met Met Lys His Val Ala Val Arg  
20 25 30

gag cct aaa ata gaa tta gca aaa gaa gct ata tta aaa att aat gcg 144  
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Cys Ala Val Asn Thr Ile Lys Ser Asp Leu Glu Ile Phe Gly Arg Leu  
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Thr Pro Val Gly Asp Gly Ile Lys Met His Glu Thr Val Ile Asn Gln  
 100 105 110

Met Pro Pro Gln Ala Ala Val Ile Leu Leu Thr Asp Gly His Asn Asn  
 115 120 125

Leu Gly Met Asn Pro Val Glu Glu Val Lys Ser Ile Tyr Gln Thr Asn  
 130 135 140

Pro Asn Val Cys Phe His Val Val Ser Phe Ala Asp Asp Ala Glu Gly  
 145 150 155 160

Lys Ala Ile Ile Asp Gln Ile Val Ala Leu Asn Ser Gly Ser Val Leu  
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85 90 95

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115 120 125

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130 135 140

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145 150 155 160

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165 170 175

ata aaa att gct cca tgg ggt atg ttt gct ttt gca ggt aag aag agc 576  
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195	200	205	
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Leu Pro Ala Met Pro Ala Gly Phe Gly Tyr Ser Trp Gly Ala Gly Asn			
210	215	220	
cca ttt gga gat gtt ttt cca aat aaa aag cgt ggt aat gca tgg tgg			720
Pro Phe Gly Asp Val Phe Pro Asn Lys Lys Arg Gly Asn Ala Trp Trp			
225	230	235	240
gtt ggt tta tca gct gaa ctt gct ggc tca agt cct ttg cat ata gct			768
Val Gly Leu Ser Ala Glu Leu Ala Gly Ser Ser Pro Leu His Ile Ala			
245	250	255	
gtt gat ggt gct tat gga cga gca gac tta gga agt ctt aga aat gtt			816
Val Asp Gly Ala Tyr Gly Arg Ala Asp Leu Gly Ser Leu Arg Asn Val			
260	265	270	
gtt att ggt gac ttc tta cta gat aag att gat tta aaa cgt caa ggt			864
Val Ile Gly Asp Phe Leu Leu Asp Lys Ile Asp Leu Lys Arg Gln Gly			
275	280	285	
tgg tat gca gca tta tta gca gaa tat aaa ttt gaa tat gta act cca			912
Trp Tyr Ala Ala Leu Leu Ala Glu Tyr Lys Phe Glu Tyr Val Thr Pro			
290	295	300	
ggg gtt ata ggt tgg tat gcc tca gga gat aaa gtt gat tca cgt ggc			960
Gly Val Ile Gly Trp Tyr Ala Ser Gly Asp Lys Val Asp Ser Arg Gly			
305	310	315	320
gcc tct aaa aga ata cca aca tta gtt gga aac tgg tca gca aca agt			1008
Ala Ser Lys Arg Ile Pro Thr Leu Val Gly Asn Trp Ser Ala Thr Ser			
325	330	335	
ttt gga tat agt gga gcc tat ggt ata ggc aaa gat tct gtt ttt gga			1056
Phe Gly Tyr Ser Gly Ala Tyr Gly Ile Gly Lys Asp Ser Val Phe Gly			
340	345	350	
aat act att gct ggc tca tgg ggt gtt gta gtt cag ttg aaa gat att			1104
Asn Thr Ile Ala Gly Ser Trp Gly Val Val Val Gln Leu Lys Asp Ile			
355	360	365	
tct ttc tta gaa aat cta act cat ggt atc cgt gga gct aga att cag			1152
Ser Phe Leu Glu Asn Leu Thr His Gly Ile Arg Gly Ala Arg Ile Gln			

370	375	380	
ggt aca aat aat aaa gac gtt cct gaa cac tta ggt tta tca tac gtt 1200			
Gly Thr Asn Asn Lys Asp Val Pro Glu His Leu Gly Leu Ser Tyr Val			
385	390	395	400
act acc att tat gac aca cgt ggt ggt gat aat atg ctt tac tta aca 1248			
Thr Thr Ile Tyr Asp Thr Arg Gly Gly Asp Asn Met Leu Tyr Leu Thr			
405	410	415	
aag aaa gat tat gct tgg gaa gta gat ttt gat act gaa tat aaa atc 1296			
Lys Lys Asp Tyr Ala Trp Glu Val Asp Phe Asp Thr Glu Tyr Lys Ile			
420	425	430	
tat aaa gac tta agt gta gct ctt gaa ctg tca tat att cgt ctt gaa 1344			
Tyr Lys Asp Leu Ser Val Ala Leu Glu Leu Ser Tyr Ile Arg Leu Glu			
435	440	445	
ctt gat aaa aaa cta tgg aac ctt caa aga gaa gtt gat aag aat gcc 1392			
Leu Asp Lys Leu Trp Asn Leu Gln Arg Glu Val Asp Lys Asn Ala			
450	455	460	
tat cgt gct ggt tta aat atg aag tat caa ttc taa 1428			
Tyr Arg Ala Gly Leu Asn Met Lys Tyr Gln Phe			
465	470	475	
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Ala Ile Asp Phe Lys Ala Lys Gly Val Trp Asp Phe Asn Phe Glu Trp			
1	5	10	15
Gln Gln Ser Ser Phe Met Lys Gly Asp Gly Asp Gln Arg Phe Ser Pro			
20	25	30	
Lys Gln Arg Leu Arg Thr Gln Ile Asp Ile Val Ala Ser Glu Ser Leu			
35	40	45	
Lys Gly Val Val Phe Phe Glu Leu Gly Lys Thr Ile Trp Gly Arg Gly			
50	55	60	
Val Asp Gly Ala Ser Ile Gly Thr Asp Gly Lys Asn Val Ile Lys Leu			
65	70	75	80

Arg Tyr Ser Tyr Val Asp Trp Val Ile Pro Tyr Thr Asp Val Gln Val  
85 90 95

Arg Met Gly Leu Gln Pro Tyr Val Leu Pro Gly Phe Val Ala Gly Ser  
100 105 110

Thr Ile Leu Asp Ala Asp Gly Ala Gly Val Thr Val Ser Ala Val Phe  
115 120 125

Asn Asp Tyr Leu Gly Ala Thr Ala Phe Trp Met Arg Ala Leu His Lys  
130 135 140

Asn Tyr Asp Ser Asn Tyr Gly Ile Ser Lys Leu Pro Asn Phe Lys Gly  
145 150 155 160

Thr Thr Leu Asp Val Val Gly Leu Thr Ile Pro Val Thr Ile Ser Asp  
165 170 175

Ile Lys Ile Ala Pro Trp Gly Met Phe Ala Phe Ala Gly Lys Lys Ser  
180 185 190

Leu Leu Gly Glu Ser Tyr Gly Asp Ile Glu Asp Val Arg Ala Gly Leu  
195 200 205

Leu Pro Ala Met Pro Ala Gly Phe Gly Tyr Ser Trp Gly Ala Gly Asn  
210 215 220

Pro Phe Gly Asp Val Phe Pro Asn Lys Lys Arg Gly Asn Ala Trp Trp  
225 230 235 240

Val Gly Leu Ser Ala Glu Leu Ala Gly Ser Ser Pro Leu His Ile Ala  
245 250 255

Val Asp Gly Ala Tyr Gly Arg Ala Asp Leu Gly Ser Leu Arg Asn Val  
260 265 270

Val Ile Gly Asp Phe Leu Leu Asp Lys Ile Asp Leu Lys Arg Gln Gly  
275 280 285

Trp Tyr Ala Ala Leu Leu Ala Glu Tyr Lys Phe Glu Tyr Val Thr Pro  
290 295 300

Gly Val Ile Gly Trp Tyr Ala Ser Gly Asp Lys Val Asp Ser Arg Gly  
305 310 315 320

Ala Ser Lys Arg Ile Pro Thr Leu Val Gly Asn Trp Ser Ala Thr Ser  
325 330 335

Phe Gly Tyr Ser Gly Ala Tyr Gly Ile Gly Lys Asp Ser Val Phe Gly  
340 345 350

Asn Thr Ile Ala Gly Ser Trp Gly Val Val Val Gln Leu Lys Asp Ile  
355 360 365

Ser Phe Leu Glu Asn Leu Thr His Gly Ile Arg Gly Ala Arg Ile Gln  
370 375 380

Gly Thr Asn Asn Lys Asp Val Pro Glu His Leu Gly Leu Ser Tyr Val  
385 390 395 400

Thr Thr Ile Tyr Asp Thr Arg Gly Gly Asp Asn Met Leu Tyr Leu Thr  
405 410 415

Lys Lys Asp Tyr Ala Trp Glu Val Asp Phe Asp Thr Glu Tyr Lys Ile  
420 425 430

Tyr Lys Asp Leu Ser Val Ala Leu Glu Leu Ser Tyr Ile Arg Leu Glu  
435 440 445

Leu Asp Lys Lys Leu Trp Asn Leu Gln Arg Glu Val Asp Lys Asn Ala  
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Tyr Arg Ala Gly Leu Asn Met Lys Tyr Gln Phe  
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1 5 10

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atata

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Ala Glu Val Thr Ala Ser Cys Thr Lys Arg Val Gly
    1           5           10

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Gly Val Asn Phe Ala Phe Asp Ser Phe Ala Leu Asp Asp Thr Ala Lys
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Ile Asp Phe Lys Ala Lys Gly Val Trp Asp Phe Asn  
1 5 10

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Lys Asp Tyr Ala Trp Glu Val Asp Phe Asp Thr  
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Ala Ala Tyr Glu Tyr Leu Val Met Leu Gly Val Asn  
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Gly Thr Gln Glu Tyr Asn Leu Ala Leu Gly Glu Arg  
1 5 10